Amendments to the Claims

1. (original): An apparatus for directional solidification of a metal comprising:

a vessel for containing a molten mass of the metal;

a plurality of induction coils surrounding the height of the exterior of the vessel; and

a means for selectively applying ac current to each of the plurality of induction coils to inductively heat the molten mass of the metal in the vessel with applied heat progressively decreasing from the bottom to the top of the molten mass of the metal in the vessel whereby the molten mass solidifies in the vessel from the bottom to the top of the vessel.

2. (original): The apparatus of claim 1 wherein the means for selectively applying ac current to each of the plurality of induction coils comprises:

a switching means for each of the plurality of induction coils, each of the switching means having a first switch terminal and a second switch terminal, each of the first switch terminals exclusively connected to a first coil terminal of each of the plurality of induction coils;

a source of ac current having a first source terminal and a second source terminal, the first source terminal connected to all of the second switch terminals, the second source terminal connected to all of the second coil terminals; and

a control means for selectively opening and closing each of the switching means to progressively decrease the induced heat from the bottom to the top of the molten mass of the metal in the vessel.

3. (original): The apparatus of claim 1 further comprising a means for selectively cooling the molten mass of the metal in the vessel progressively from the bottom to the top of the molten mass of the metal in the vessel, the means for selectively cooling disposed exteriorly around the height of the vessel.

4. (original): The apparatus of claim 3 wherein the means for selectively cooling comprises a cooling medium flowing in each of the plurality of induction coils.

5. (original): The apparatus of claim 1 further comprising a means for cooling the molten mass of the metal in the vessel from the bottom of the molten mass.

6. (original): The apparatus of claim 3 further comprising a means for cooling the molten mass of the metal in the vessel from the bottom of the molten mass.

7. (original): The apparatus of claim 1 further comprising a means for pushing the solidified metal out of the vessel.

8. (original): The apparatus of claim 1 further comprising a sensor means to sense the progress of solidification of the mass of molten metal from the bottom to the top of the vessel.

9. (original): The apparatus of claim 1 further comprising a feedback means for adjusting the means for selectively applying ac current to each of the plurality of induction coils to control the progress of solidification of the mass of molten metal from the bottom to the top of the vessel.

10. (original): A method of directional solidification of a molten mass of a metal comprising the steps of:

placing the molten mass of the metal in a vessel;

surrounding the exterior of the vessel with a plurality of induction coils;

selectively supplying an ac current to each of the plurality of induction coils to heat the molten mass of the metal in the vessel; and

progressively decreasing the applied heat by induction from the bottom to the top of the molten mass of the metal in the vessel to solidify the molten mass in the vessel from the bottom to the top of the vessel.

11. (original): The method of claim 10 further comprising the step of progressively cooling the molten mass of the metal in the vessel from the bottom to the top of the molten mass of the metal in the vessel.

12. (original): The method of claim 10 further comprising the step of pushing the solidified metal out of the vessel.

13. (original): An apparatus for directional solidification of a metal comprising:

a susceptor vessel for containing a molten mass of the metal;

a plurality of induction coils surrounding the height of the exterior of the susceptor vessel; and

a means for selectively applying ac current to each of the plurality of induction

coils to inductively heat the susceptor vessel with applied heat progressively decreasing from the bottom to the top of the susceptor vessel whereby the molten mass solidifies in the vessel from the bottom to the top of the vessel by heat transfer from the susceptor vessel to the molten mass of the metal in the vessel.

14. (original): The apparatus of claim 13 wherein the means for selectively applying ac current to each of the plurality of induction coils comprises:

a switching means for each of the plurality of induction coils, each of the switching means having a first switch terminal and a second switch terminal, each of the first switch terminals exclusively connected to a first coil terminal of each of the plurality of induction coils;

a source of ac current having a first source terminal and a second source terminal, the first source terminal connected to all of the second switch terminals, the second source terminal connected to all of the second coil terminals; and

a control means for selectively opening and closing each of the switching means to progressively decrease the induced heat from the bottom to the top of the molten mass of the metal in the vessel.

15. (original): The apparatus of claim 13 further comprising a means for selectively cooling the molten mass of the metal in the vessel progressively from the bottom to the top of the molten mass of the metal in the vessel, the means for selectively cooling disposed exteriorly around the height of the vessel.

16. (original): The apparatus of claim 15 wherein the means for selectively cooling comprises a cooling medium flowing in each of the plurality of induction coils.

17. (original): The apparatus of claim 13 further comprising a means for cooling the molten mass of the metal in the vessel from the bottom of the molten mass.

18. (original): The apparatus of claim 15 further comprising a means for cooling the molten mass of the metal in the vessel from the bottom of the molten mass.

19. (original): The apparatus of claim 13 further comprising a means for pushing the solidified metal out of the vessel.

20. (original): The apparatus of claim 13 further comprising a sensor means to sense the progress of solidification of the mass of molten metal from the bottom to the top of the

vessel.

21. (original): The apparatus of claim 13 further comprising a feedback means for adjusting the means for selectively applying ac current to each of the plurality of induction coils to control the progress of solidification of the mass of molten metal from the bottom to the top of the vessel.

22. (original): A method of directional solidification of a molten mass of a metal comprising the steps of:

placing the molten mass of the metal in a susceptor vessel;

surrounding the exterior of the susceptor vessel with a plurality of induction coils;

selectively supplying an ac current to each of the plurality of induction coils to heat the susceptor vessel to heat by conduction and radiation the molten mass of the metal in the susceptor vessel; and

progressively decreasing the applied heat by induction from the bottom to the top of the susceptor vessel to solidify the molten mass in the susceptor vessel from the bottom to the top of the vessel.

23. (original): The method of claim 22 further comprising the step of progressively cooling the molten mass of the metal in the susceptor vessel from the bottom to the top of the molten mass of the metal in the vessel.

24. (original): The method of claim 22 further comprising the step of pushing the solidified metal out of the vessel.